

AMENDMENT

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 – 29 (cancelled)

~~31~~30. (currently amended) A computer readable medium programmed to operate a method of removing an empty string term from an automaton A having a set of states “p” and a set of states “q”, the method comprising:

computing an ϵ -closure for each state “p” of the automaton A;

modifying outgoing transitions of each state “p” by:

removing each transition labeled with an empty string; and

adding to each transition leaving “p” a non-empty-string transition, wherein each state “q” is left with its weights pre- \otimes -multiplied by an ϵ -distance from state “p” to a state “q” in the automaton A.

~~32~~31. (currently amended) The computer readable medium of claim ~~31~~30, the method on the computer readable medium further comprising:

removing inaccessible states using a depth-first search of the automaton A.

~~33~~32. (currently amended) The computer readable medium of claim ~~31~~30, wherein the step of adding to E[p] non-empty-string transitions further comprises leaving q with weights ($d[p,q] \otimes w[e]$) to the transitions leaving p.

~~34~~33. (currently amended) The computer readable medium of claim ~~31~~30, wherein the step of computing ϵ -closure for each input state of an input automaton A further comprises:

removing all transitions not labeled with an empty string from automaton A to produce an automaton A_ϵ ;

decomposing A_ϵ into its strongly connected components; and

computing all-pairs shortest distances in each component visited in reverse topological order.

3534. (currently amended) A circuit programmed to operate a method of removing an empty string term from an automaton A having a set of states "p" and a set of states "q", the method comprising:

computing an ϵ -closure for each state "p" of the automaton A;

modifying outgoing transitions of each state "p" by:

removing each transition labeled with an empty string; and

adding to each transition leaving "p" a non-empty-string transition, wherein each state "q" is left with its weights pre-multiplied by an ϵ -distance from state "p" to a state "q" in the automaton A.

3635. (currently amended) The circuit of claim 3534, the method programmed into the circuit further comprising:

removing inaccessible states using a depth-first search of the automaton A.

3736. (currently amended) The circuit of claim 3534, wherein the step of adding to $E[p]$ non-empty-string transitions further comprises leaving q with weights $(d[p,q] \otimes w[e])$ to the transitions leaving p.

3837. (currently amended) The circuit of claim 3534, wherein the step of computing ϵ -closure for each input state of an input automaton A further comprises:

removing all transitions not labeled with an empty string from automaton A to produce an automaton A_ϵ ;

decomposing A_ϵ into its strongly connected components; and

computing all-pairs shortest distances in each component visited in reverse topological order.

3938. (currently amended) A computer readable medium programmed to operate a method of removing an empty string term from a transducer A having a set of states "p" and a set of states "q", the method comprising:

computing an ϵ -closure for each state "p" of the transducer A;

modifying outgoing transitions of each state "p" by:

removing each transition labeled with an empty string; and

adding to each transition leaving "p" a non-empty-string transition, wherein each state "q" is left with its weights pre- \otimes -multiplied by an ϵ -distance from state "p" to a state "q" in the transducer A.

4039. (currently amended) The computer readable medium of claim 3938, the method on the computer readable medium further comprising:

removing inaccessible states using a depth-first search of the transducer A.

4140. (currently amended) The computer readable medium of claim 3938, wherein the step of adding to $E[p]$ non-empty-string transitions further comprises leaving q with weights $(d[p,q] \otimes w[e])$ to the transitions leaving p.

4241. (currently amended) The computer readable medium of claim 3938, wherein the step of computing ϵ -closure for each input state of an input transducer A further comprises:

removing all transitions not labeled with an empty string from transducer A to produce a transducer A_ϵ ;

decomposing A_ϵ into its strongly connected components; and

computing all-pairs shortest distances in each component visited in reverse topological order.

4342. (currently amended) A circuit programmed to operate a method of removing an empty string term from a transducer A having a set of states "p" and a set of states "q", the method comprising:

computing an ϵ -closure for each state "p" of the transducer A;

modifying outgoing transitions of each state "p" by:

removing each transition labeled with an empty string; and

adding to each transition leaving "p" a non-empty-string transition, wherein each state "q" is left with its weights pre- \otimes -multiplied by an ϵ -distance from state "p" to a state "q" in the transducer A.

4443. (currently amended) The circuit of claim 4342, the method programmed into the circuit further comprising:

removing inaccessible states using a depth-first search of the transducer A.

4544. (currently amended) The circuit of claim 4342, wherein the step of adding to $E[p]$ non-empty-string transitions further comprises leaving q with weights $(d[p,q] \otimes w[e])$ to the transitions leaving p.

4645. (currently amended) The circuit of claim 4342, wherein the step of computing ϵ -closure for each input state of an input transducer A further comprises:

removing all transitions not labeled with an empty string from transducer A to produce a transducer A_ϵ ;

decomposing A_ϵ into its strongly connected components; and

computing all-pairs shortest distances in each component visited in reverse topological order.

4746. (cancelled)

4847. (currently amended) The ~~automaton~~ computer-readable medium of claim 4754, the method of creating the automaton B further comprising:

removing inaccessible states using a depth-first search of the input automaton.

4948. (currently amended) The ~~automaton~~ computer-readable medium of claim 4754, wherein the step of adding to $E[p]$ non- ϵ -transitions further comprises leaving q with weights $(d[p,q] \otimes w[e])$ to the transitions leaving p.

5049. (currently amended) ~~A-automaton~~ The computer-readable medium of claim 4754, wherein the step of computing an ϵ -closure for each input state of an input automaton A further comprises:

removing all transitions not labeled with an empty string from automaton A to produce an automaton A_ϵ ;

decomposing A_ϵ into its strongly connected components; and

computing all-pairs shortest distances in each component visited in reverse topological order.

5150. (cancelled)

5251. (currently amended) The ~~automaton~~ computer-readable medium of claim 5155, the method of creating the transducer B further comprising:

removing inaccessible states using a depth-first search of the input transducer.

5352. (currently amended) The ~~automaton~~ computer-readable medium of claim 5155, wherein the step of adding to $E[p]$ non- ϵ -transitions further comprises leaving q with weights $(d[p,q] \otimes w[e])$ to the transitions leaving p .

5453. (currently amended) The computer-readable medium ~~A-automaton~~ of claim 5155, wherein the step of computing an ϵ -closure for each input state of an input transducer A further comprises:

removing all transitions not labeled with an empty string from transducer A to produce a transducer A_ϵ ;

decomposing A_ϵ into its strongly connected components; and

computing all-pairs shortest distances in each component visited in reverse topological order.

5554. (currently amended) A computer readable medium storing an executable automaton B having no ϵ -transitions, the automaton B produced according to a method of removing ϵ -transitions from an input automaton A having a set of states "p" and a set of states "q", the method comprising:

computing an ϵ -closure for each state "p" of the input automaton;

modifying outgoing transitions of each state "p" by:

removing each ϵ -transitions; and

adding to each transition leaving “p” a non- ϵ -transitions, wherein each state “q” is left with its weights pre-multiplied by an ϵ -distance from state “p” to a state “q” in the input automaton.

~~5655~~. (currently amended) A computer readable medium storing an executable transducer B having no ϵ -transitions, the transducer B produced according to a method of removing ϵ -transitions from an input transducer A having a set of states “p” and a set of states “q”, the method comprising:

- computing an ϵ -closure for each state “p” of the input automaton;
- modifying outgoing transitions of each state “p” by:
 - removing each ϵ -transitions; and
 - adding to each transition leaving “p” a non- ϵ -transitions, wherein each state “q” is left with its weights pre-multiplied by an ϵ -distance from state “p” to a state “q” in the input transducer.